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Electronic Health Records: Rural survey results.

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ABSTRACT (REQUIRED)

This paper focuses on the results of a recent survey of rural health care providers investigating the perceptions of health professionals toward the investigation and implementation of electronic health records (EHRs) in South Dakota.

Keywords

Electronic health records, user adoption, physicians, health information systems, diffusion of innovation, user acceptance, perceptions. Survey questions were based on a previous health care survey conducted in 2007 and published survey question used by other researchers.

INTRODUCTION

The U.S. government proposed a mandate for the implementation of electronic health records (EHRs) for all Americans by the year 2014. However, the support for a system to support this innovation has been lacking (Gans et. al., 2005). U.S. physicians have been slow to adopt these systems with a recent national survey estimating EHR adoption in an ambulatory care environment to be 13 percent for a minimal implementation and only 4 percent for a fully functional EHR system implementation (DesRoches, Campbell et al. 2008). Recent legislation provides incentives to physicians and hospitals to implement such technology through Medicare and Medicaid (Steinbrook, 2009). There is still doubt that the critical mass of adoption of EHR systems is unlikely even with the financial incentives.

It is easy to see the benefits of an EHR including less medical errors but acceptance of the technology is not sufficient to meet the government timeline (Chaudhry, Wang, Wu., 2006). This study was conducted to assess the status of EHR implementation and adoption in clinics, hospitals, and long term care facilities in a rural state environment. The purpose of this study was to follow-up on a previous study to investigate the factors influencing health care providers' attitudes toward EHR systems including facilitating and inhibiting factors for adoption and implementation. The reporting of the results of this study benefits researchers in medical informatics field by describing EHR success and failure factors.

Future research will examine survey constructs using adoption research models such as the Diffusion of Innovations (DOI) theory and the Technology Acceptance Model (TAM). This publication will present general statistics relating to the drivers and barriers to the adoption of EHR.

BACKGROUND

Adoption of healthcare information systems and specifically electronic health records has been extensively studied in literature. While the information systems research community has approached this issue from a technology acceptance and use perspective, medical informatics researchers have explored the issue to explore specific barriers and facilitators of EHR adoption in order to inform policy initiatives. The unified theory of acceptance and use of technology (UTAUT) (Venkatesh, Morris et al. 2003) has been used to understand the factors affecting the adoption of information technology. (Hennington and Janz 2007) apply the UTAUT model to the EHR context and develop several healthcare specific propositions based the relationships predicted by the UTAUT model. The authors then analyze existing literature to explore the extent to which the UTAUT model holds in the healthcare context. The UTAUT model has also been used as a framework to study Nurses' use

of mandated EHR systems (Hennington, Janz et al. 2009). Other models used to study the adoption problem include an institutional theory perspective, where the author explores the impact incentives and penalties on the intention to adopt by independent physician practices (Sherer 2010). In addition to adoption issues, researchers have explored the intention for continued use of medical information systems based on work practice compatibility and technology acceptance models (Tulu, Burkhard et al. 2006).

While IS research on EHR adoption has resulted in deeper theoretical insights into technology acceptance and use models, specific information on the barriers and facilitators of EHR adoption is required for the design more immediate policy interventions to increase adoption. Recent research in this area includes a study of EHR adoption in ambulatory care (Simon, Kaushal et al. 2007; DesRoches, Campbell et al. 2008), hospitals (Jha, DesRoches et al. 2009) and community health centers (Shields, Shin et al. 2007). The level of EHR adoption reported in the different surveys ranges between 9% – 23%. In a recent nationwide survey of physicians by (DesRoches, Campbell et al. 2008), 17% of the physicians reported having either a basic or fully functional EHR system. Other surveys have reported an adoption rate of 23% among physician office practices (Simon, Kaushal et al. 2007) and around 9% in US hospitals (Jha, DesRoches et al. 2009). Financial barriers such as lack of initial capital and lack of incentives for implementation are the most common barrier reported across different types of facilities. Other major barriers include resistance from physicians, loss of productivity and inability to find products that meet physician needs.

While most surveys explored the barriers and facilitators of adoption from a broad national perspective, there is limited work that explores these issues in a rural context where the infrastructure capabilities and health service delivery needs vary significantly from urban areas. Rural health care facilities face greater challenges in adopting health IT with respect to scarce resources, relative lack of broadband access, vendor issues, and interoperability (Moiduddin and Stromberg, 2009). Rural health care providers may lag in adherence to clinical guidelines for treating diabetes (Coon and Zulkowski, 2000). Nonetheless, rural hospitals can overcome these barriers (Bahensky et al., 2008). In this paper, we study the barriers and facilitators of adoption specific to rural and areas in the Midwest and compare the results with national trends.

DISCUSSION

The survey used for this report is a follow-up survey of health professional in the state of South Dakota. The survey was administered in 2009. Questions asked on this survey are following up information collected with a survey conducted in 2007 that was administered by the South Dakota Department of Health. The initial survey was entitled South Dakota Electronic Health Record Assessment Survey. Information about that survey and steps leading up to its administration can be examined at the South Dakota Health Information Technology Summit 2007 under publications, specifically *SDEHRAFinalReport-Assessment.pdf* (SDEHRA, 2007). The 2009 survey incorporated some questions from the initial survey administered in 2007. Members of the South Dakota eHealth Collaborative, including state government officials and health care administrators, reviewed draft questions and gave guidance for the final draft and administration of the survey.

The Center for Advancement of Health Information Technology (CAHIT) associated with Dakota State University (DSU) distributed the survey to all South Dakota health care facilities by mail, providing paper copies of the complete survey as well as directions to an online version of the survey. The initial mailing went to 335 addresses, 30 of which were returned as bad addresses. DSU received 101 usable responses, most by mail, with data entered for analysis by CAHIT staff. This number of responses represents a 33% response rate from the delivered surveys. This response rate is significantly lower than average response rates to surveys on medical topics of around 60% (Asch et al., 1997). However, 33% exceeds the expectations for information technology adoption surveys, and prior research suggests that healthcare IT user non-respondents tend not to differ from respondents (Hikmet and Chen, 2003). Surveys were sent to ambulatory care/clinics, hospitals, and long-term care facilities.

The survey had questions sections dealing with the following areas; health provider information, level of EHR adoption, adoption facilitators, adoption barriers, readiness, data capture and sharing, implementation approaches, and process satisfaction. In this preliminary report we will evaluate the major barriers to EMR adoption in this survey to a recent national survey conducted by the research group headed by Ashish Jha, (Jha, DesRoches, Campbell, Donelan, Rao, Ferris, Shields, Rosenbaum, Blumenthal, 2009). To investigate barriers, the current study asked all respondents, whether they had acquired an EMR system or not, to rate four categories of possible barriers gathered from existing literature: financial, legal/regulatory, organizational/operational, and technological. Of twenty barriers named by the survey, only the cost of EMR acquisition and implementation was cited as a major barrier by a majority of respondents (58%). Systems integration was the next most frequently cited major barrier (37% of respondents), followed by ongoing maintenance cost, lack of financial incentives, and lack of interoperability (all three cited by 35% of respondents). The barriers found in this study were very similar to those found in the Cohn study. Table one matches the top five barriers from the national study conducted by Cohn to the results of the study.

The result of the South Dakota survey closely follows the findings of the national survey with the exception of resistance on the part of physicians where the local survey results are much lower than those reported on the national survey. This may be due to the selection of technology adopting tendencies by the survey participants. The survey results support the high adoption motivation with over 80% of the respondents responding with a positive response in regards to the innovative ability of both their physicians and other medical staff.

This publication is intended a preliminary report of the survey findings. Subsequent publications will use factor analysis to ascertain the trends contained within the gathered data. Analysis of this, and other, data with a data analysis program such as PLS Graph should generate information of interest to researchers in the area.

Major Barriers to EMR Adoption				
	Jha, et al. (2009)		CAHIT (2009)	
	With EHR	Without EHR	With EHR	Without EHR
inadequate Capital for Purchase	61%	74%	39%	77%
Concerns about Maintenance Costs	31%	44%	25%	43%
Resistance on the Part of Physicians	38%	36%	8%	14%
Uncertainty about ROI	24%	32%	10%	41%
Lack of Availability of IT Staff	24%	30%	24%	41%

CONCLUSION

The government has initiated a mandate for EHR adoption with a target date of 2014. However barriers exist in the perception of national and regional providers that interfere with the success of this initiative. In this report on a rural state EHR survey it was found that those barrier are not perceived to be so great in this particular environment. In 44, out of 101 responses the respondents selected satisfactory responses. Technical assistance will also help promote EMR adoption, although health care providers, with their increasing embrace of technology, show signs of lessening concern about technological barriers to transitioning to EMR systems. Again, sharing the experience of EMR adopters may be one of the best selling points to bring other facilities online, as South Dakota health providers who have adopted EMR systems report overwhelming satisfaction with their systems.

This publication is intended a preliminary report of the survey findings. Subsequent publications will use factor analysis to ascertain the trends contained within the gathered data. Analysis of this, and other, data with a data analysis program such as PLS Graph should generate information of interest to researchers in the area.

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